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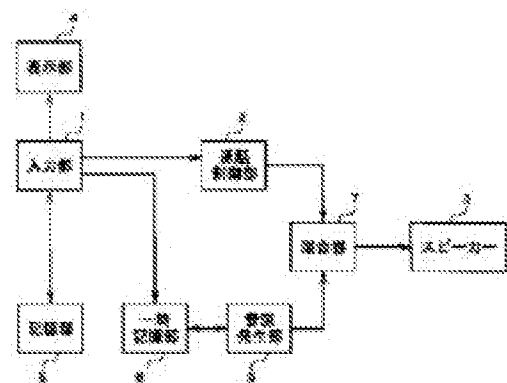
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(54) PORTABLE TELEPHONE SET

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a portable telephone set, capable of extending its application for purposes other than speeches by adding a music function to the portable telephone set and enhancing the availability of the set that is always carried.

SOLUTION: An entry section 1 enters music data consisting of beat data, tempo data and scale data and the data are displayed on a display section 4 and stored in a storage section 5, then the entry section 1 is used to read the scale data at a speed in matching with a tempo of the music data played from the storage section 1, and octave data and scale data are outputted to a temporary storage section 8 and a sound source generating section 6 receives the octave data and the scale data from the temporary storage section 8, converts them into audio signals and outputted to a mixer 7. The mixer 7 synthesizes the audio signal received from the sound source generating section 6, with the voice signal of the opposite party received from a portable telephone set main body 2 and the synthesis audio signal is outputted to a loudspeaker 3, and the loudspeaker 3 sounds the sound in this portable telephone set.



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CLAIMS

[Claim(s)]

[Claim 1] A portable telephone scale data which comprises an octave, a pitch, and sound length having expressed one note, having inputted and memorized music data which connected said scale data, having generated music according to said memorized music data with directions of a performance, and enabling a call voice and composition.

[Claim 2] A portable telephone comprising:

A call control part which controls a telephone call and outputs a call voice.

An input part which performs an input for a telephone call, and an input of music data.

A storage parts store which memorizes said music data.

A performance control section which measures timing which reads said memorized music data per scale data, outputs an octave and a pitch of said scale data and reads the following scale data by sound length of said scale data, A temporary storage part which memorizes an octave and a pitch from said performance control section, and an octave of said temporary storage part and a sound-source generating part which generates a musical audio signal according to a pitch, A mixer which compounds an audio signal of a call voice from said call control part, and an audio signal of music from said sound-source generating part, and outputs a synthetic audio signal, and a speaker which outputs a synthetic audio signal from said mixer as a sound.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a portable telephone, adds especially a musical function, and relates to the portable telephone which can raise utility value.

[0002]

[Description of the Prior Art] First, the conventional portable telephone is explained using drawing 4. Drawing 4 is a configuration block figure of the conventional portable telephone. The conventional portable telephone comprises input part 1', the call control part 2, the speaker 3, display 4', and the storage parts store 5, as shown in drawing 4.

[0003] Next, each part of the conventional portable telephone is explained concretely.

The speaker 3 outputs the sound of the call partner who received. Input part 1' inputs the telephone number etc. to call, when it relates to call control, it outputs the input to the call control part 2, and output input to display 4', and it is displayed, and it stores input in the storage parts store 5 with the directions from a key.

[0004] Display 4' displays, the information inputted by input part 1', the general information in a portable telephone, for example, the telephone number etc. which were searched, etc. The storage parts store 5 memorizes the telephone number etc. which were inputted by input part 1'.

[0005] The call control part 2 controls the general telephone call in a portable telephone, and specifically, Dispatch control which sends by the telephone number inputted from input part 1', mail arrival control which receives a call, and call control which transmits the sound inputted from the microphone, receives the sound from the partner of a telephone call, and is outputted to the speaker 3 are performed.

[0006] Next, operation of the conventional portable telephone is explained. If a telephone number will be displayed on display 4' at the time of dispatch if a telephone number is inputted from input part 1', the speaking key is pressed by the user and it changes the conventional portable telephone into an off-hook state, it will succeed in dispatch by the telephone number concerned from the call control part 2.

[0007] Or if the call of a registered telephone number is directed by input part 1', The telephone number memorized by the storage parts store 5 is read, and a telephone number is displayed on display 4' in order, and if the speaking key is pressed by the user and he changes into an off-hook state, it will succeed in dispatch by a telephone number on display from the call control part 2.

[0008] If the call control part 2 will drive the speaker 3, and it will succeed in call operation, if a call is received by the call control part 2, and a user changes into an off-hook state from input part 1' at the time of mail arrival, a portable telephone will

be in a talk state and call control will be performed by the call control part 2.

[0009]Here, in the call control of the call control part 2, a user's sound which the sound of the call partner who received was outputted to the speaker 3, and was inputted from the microphone in the call control part 2 is transmitted.

[0010]

[Problem to be solved by the invention]However, in the above-mentioned conventional portable telephone, since the telephone call was made into the key objective, it was not used for the other use, but although it is what is always carried, there was a problem of not having been utilized in respect of another side, for example, amusement etc., in it.

[0011]In view of the above-mentioned actual condition, it succeeded in this invention, and by adding a musical function to a portable telephone, it expands a use besides a telephone call and an object of this invention is to provide the portable telephone which can raise the utility value as what is always carried.

[0012]

[Means for solving problem]The invention according to claim 1 for solving the problem of the above-mentioned conventional example, In a portable telephone, the scale data which comprises an octave, a pitch, and sound length expresses one note, The music data which connected said scale data is inputted and memorized, music is generated according to said memorized music data with directions of a performance, it is characterized by enabling a call voice and composition, a musical input and performance can be performed, and the performance of a call voice and music can be compounded and outputted.

[0013]The invention according to claim 2 for solving the problem of the above-mentioned conventional example, The call control part which controls a telephone call and outputs a call voice in a portable telephone, The input part which performs the input for a telephone call, and the input of music data, and the storage parts store which memorizes said music data, The performance control section which measures the timing which reads said memorized music data per scale data, outputs the octave and pitch of said scale data and reads the following scale data by the sound length of said scale data, The temporary storage part which memorizes the octave and pitch from said performance control section, and the octave of said temporary storage part and the sound-source generating part which generates a musical audio signal according to a pitch, The mixer which compounds the audio signal of the call voice from said call control part, and the audio signal of the music from said sound-source generating part, and outputs a synthetic audio signal, It is characterized by having a speaker which outputs the synthetic audio signal from said mixer as a sound, a musical input and performance can be performed, and the performance of a call voice and music can be compounded and outputted.

[0014]

[Mode for carrying out the invention]The embodiment is described about invention concerning a claim, referring to Drawings. By a key, a portable telephone concerning this invention inputs data of a note which constitutes music, memorizes it to a storage parts store, and with directions of a performance. Since read data of a note memorized to a storage parts store, a sound is generated according to data of a read note, it compounds with a sound of a telephone call and it outputs, a function as a musical instrument can be added to a portable telephone, and utility value in respect of amusement can be raised.

[0015]First, composition of a portable telephone concerning this invention is explained using drawing 1. Drawing 1 is a configuration block figure of a portable telephone concerning this invention. The same mark is attached and explained about a portion which

takes the same composition as drawing 4.

[0016]A portable telephone of this invention comprises the input part 1, the call control part 2, the speaker 3, the display 4, and the storage parts store 5 as the fundamentally same portion as the conventional portable telephone, and also the sound-source generating part 6, the mixer 7, and the temporary storage part 8 are formed as a characterizing portion of this invention. The input part 1 of this invention differs in the contents of processing from conventional input part 1'.

[0017]Next, although each part of a portable telephone of this invention is explained concretely, since the call control part 2 is completely the same as usual, explanation is omitted.

[0018]a key as a portable telephone with the common input part 1 -- in addition, as a characterizing portion of this invention, a [mode] key is newly provided and a this [mode] key changes operational mode of a portable telephone.

[0019]As a mode of a portable telephone, in telephone (telephone call) mode in which it operates, as a common portable telephone as usual here In addition, sound recording mode which makes data of music which is a characterizing portion of this invention input and memorize, Memorized music is performed or there is performance (reproduction) mode in which data of a sound is inputted and performed in real time. In all the modes, arrival of a telephone presupposes that it is possible.

[0020]And in the input part 1, at the same time of telephone (telephone call) mode as usual. If it is assigned so that it may operate as an object for portable telephones with each common key, and a [mode] key changes to performance mode or sound recording mode (a performance and sound recording mode), It assigns so that it may succeed in an input with each key special as a performance and an object for sound recording, and it succeeds in processing according to it.

[0021]Next, assignment of each key in the input part 1 of a portable telephone of this invention is explained using drawing 2. Drawing 2 is an appearance front view of a portable telephone of this invention. As assignment of each key in the input part 1 of a portable telephone of this invention is shown in drawing 2, at the time of telephone (telephone call) mode, it is assigned as the same key for portable telephones as usual, and the function is indicated in the upper part of a key. If the function is indicated in the lower part of some keys and a function at the time of a performance and sound recording mode is changed to a performance and sound recording mode to it, it will be assigned as a key for a performance / sound recording, and will function.

[0022]Here, a function of each key at the time of a performance and sound recording mode, and telephone (telephone call) mode is explained using drawing 3. Drawing 3 is an explanatory view showing a function of each key at the time of a performance and sound recording mode in the input part 1, and telephone (telephone call) mode. Each key of the input part 1 has each function by case of a performance and sound recording mode, and a case in telephone (telephone call) mode, as shown in drawing 3.

[0023][A telephone call] (tempo) In the case of a performance and sound recording mode, a key points to setting out of tempo, and, in the case of telephone (telephone call) mode, a start (off-hook) of a telephone call at the time of dispatch or arrival is directed.

[Re-die] (playback) In the case of a performance and sound recording mode, a key points to the start of the automatic performance which performs the music currently recorded, and, in the case of telephone (telephone call) mode, directs re-dialing.

[End] (stop) In the case of a performance and sound recording mode, a key points to the stop of an automatic performance and, in the case of telephone (telephone call) mode, directs the end (on hook) of a telephone call.

[0024][**] And the [**] key points to movement of the cursor of the display 4, and is the same function in both of the modes.

[Telephone directory] (preservation) In the case of a performance and sound recording mode, a key points to preservation of the music data which is data of the music which wrote music, and, in the case of telephone (telephone call) mode, directs the call of the telephone number of the telephone directory memorized by the storage parts store 5.

[Search] (it opens) In the case of a performance and sound recording mode, a key points to read-out of the music data memorized by the storage parts store 5, and, in the case of telephone (telephone call) mode, directs search of a telephone number.

[Suspension] (a pitch/beat) In the case of a performance and sound recording mode, a key points to the change of setting out of a pitch, and setting out of a beat, and, in the case of telephone (telephone call) mode, directs suspension of a telephone call.

[0025]And in the case of a performance and sound recording mode, numerical-keypad [1] - [9], Input the data of letter-names C (**) - the letter names D (RE on RE and :1 octave), and a numerical keypad [0] (rest), inputting the data of a rest -- the [#] key -- the data of letter names -- a seminote raising and the [* (**)] key -- the data of letter names -- the case in seminote lowering and telephone (telephone call) mode -- numerical-keypad [0] - [9] and [#] [*] inputs a telephone number. Here, letter names express the sound of (RE-) with (C) to (D-) of the alphabet from (**).

[0026]Next, the entry-of-data method of concrete music is explained. One note (a rest is also included) which constitutes music comprises scale data which comprises three elements of sound length, connects scale data with an octave and a pitch, and is taken as music data.

[0027]And an octave inputs the height of an octave numerically and a pitch, Input by [9] from the numerical keypad [1] corresponding to 'D-' from 'C' of the alphabet which shows letter names, and also to a seminote raising and seminote ***** case. letter names -- the alphabet -- after -- ' -- # -- ' -- and -- ' -- * -- ' -- corresponding -- [-- # --] -- a key -- or -- [-- * --] -- a key -- inputting -- a sound -- length -- 32 -- diacritical marks -- one -- having carried out -- the time -- length -- a numerical keypad -- inputting . In the case of a rest, it will input by the numerical keypad [0] corresponding to 'R' of the alphabet, and it will input the length of a rest by a numerical keypad after R.

[0028]That is, in the input part 1, recognize the mode set up now, and with a mode. When it is necessary to distinguish the entry content over a keystroke and a numerical keypad is pushed especially in sound recording mode, if it is an input part of letter names, use the letter names corresponding to a key as input data, and let a number be input data in the other part. Concrete operation of the input in each mode is mentioned later.

[0029]The display 4 displays a telephone number etc. as usual, and also displays a file name, and a beat, tempo and scale data of music data as a characterizing portion of this invention at the time of a performance and sound recording mode. One note is expressed with an octave, a pitch, and sound length, data of the note is divided with a vertical line for every vibrant tune according to a set-up beat, and scale data is displayed.

[0030]A display example at the time of a performance and sound recording mode in a portable telephone of this invention is explained using drawing 2. A display at the time of a performance and sound recording mode in a portable telephone of this invention, For example, as shown in drawing 2, as for a file name of music data, four cycle cadence for 4 minutes and tempo xyz3 and a beat 120 and 1 vibrant-tune eye, RE of 4 octave eye -- an eighth note, a 4-minute rest, and 2 vibrant-tune eye have S0 of an eighth note and 4 octave eye D0 of a seminote ***** quarter note and 5 octave eye displayed, and S0 of an eighth note and 3 octave eye is displayed [FA / of a quarter note and 4 octave eye]

like seminote ***** 16 diacritical-marks -- in D0 of 4 octave eye.

[0031]The storage parts store 5 memorizes a telephone number as usual, and also memorizes music data as a characterizing portion of this invention.

[0032]The temporary storage part 8 memorizes temporarily the data of the octave which makes it generate in the sound-source generating part 6, and a pitch, and it specifically, The data of an octave and a pitch inputted by the input part 1 in order to perform in real time, Or the data of the octave contained in the scale data in the music data memorized by the storage parts store 5 and a pitch is stored in the temporary storage part 8 by the input part 1, and the data of an octave and a pitch is read by the sound-source generating part 6, and it is performed by the sound-source generating part 6.

[0033]The sound-source generating part 6 is changed into an audio signal according to the data of an octave and a pitch, specifically inputs the data of an octave and a pitch from the temporary storage part 8, changes it into an audio signal, and is outputted to the mixer 7. A variegated tone can be generated by changing the sound source used for the sound-source generating part 6.

[0034]The mixer 7 compounds an audio signal and an audio signal, specifically it inputs a call partner's audio signal from the call control part 2, inputs an audio signal from the sound generation part 6, compounds an audio signal and an audio signal, and outputs them to the speaker 3 as a synthetic audio signal.

[0035]The speaker 3 outputs as a sound the synthetic audio signal inputted from the mixer 7.

[0036]Next, operation of the portable telephone of this invention is explained. The portable telephone of this invention is changed to telephone mode, reproduction mode, and sound recording mode by the [mode] key of the input part 1, and the completely same operation as usual is performed at the time of telephone mode.

[0037]And at the time of sound recording mode, if the [suspension] (pitch/beat) key is pressed, If will be in a beat established state and a 'beat' is displayed on the display 4, a beat will be set up if a denominator and a numerator are inputted by [number] keystroke, and the [telephone call] (tempo) key is pressed, It will be in a tempo established state, 'T' is displayed on the display 4, and tempo is set up by [number] keystroke.

[0038]And it will be in the input state of the scale data of music, and the contents which the data of one note was inputted by the [number] key and inputted in order of an octave, letter names, and sound length are displayed on real time by the display 4, and it memorizes in the work area of the storage parts store 5. And if inputted in the same procedure as every [a first sound] one by one, the vertical line for being displayed on the display 4 and dividing for every vibrant tune according to the set-up beat will be displayed.

[0039]And when the [telephone directory] (preservation) key is pressed, a file name is inputted and the [telephone directory] (preservation) key is pressed again, the created music data is stored in the storage parts store 5 by the file name inputted from the work area of the storage parts store 5.

[0040]If [#] or the [*] key is pressed after an octave and letter names are inputted, '**' or '**' will be inputted and displayed by the [number] key after letter names. [0] If a key is pressed, 'R' will be displayed on the display 4, next a rest will be inputted if length is inputted by the [number] key.

[0041]moreover When even data to correct by [**] and the [**] key moves cursor and it is overwritten by the [number] key, the contents of music data are corrected.

[0042]On the other hand, in the case of performance mode, the playback performance which

plays and performs the real-time performance which performs the letter names inputted from the input part 1 in real time, and the recorded music data is performed.

[0043]First, in a real-time performance, if numerical-keypad [1] - [9] is pushed, A numerical keypad is changed into letter-names (C) - (D-) by the input part 1, it is stored in the temporary storage part 8 as interval data, interval data is read from the temporary storage part 8 by the sound-source generating part 6, the audio signal corresponding to letter names is generated in the sound-source generating part 6, and it is outputted to the mixer 7.

[0044]On the other hand, it is outputted to the mixer 7 by the sound of the partner received in the call control part 2, and in the mixer 7. The sound of the partner from the audio signal and the call control part 2 from the sound-source generating part 6 is compounded, it is outputted to the speaker 3 as a synthetic audio signal, and the synthetic audio signal inputted from the mixer 7 is outputted as a sound from the speaker 3.

[0045]the sound of the letter names corresponding to a numerical keypad if the [number] key is pressed, pressing the [#] key or the [* (**)] key -- a seminote top -- or the bottom of a seminote -- it is outputted from the speaker 3.

[0046]It is in order to make the audio signal of a sound lower than [1] (**) which is a numerical keypad, and a sound higher than [9] (RE-) of a numerical keypad output, The [suspension] (pitch/beat) key is pressed, setting out of a pitch is chosen, and compass is shifted to a top and the bottom by [**] and the [**] key, respectively. However, since this is not changed in an instant, it may be unable to correspond at the time of a real-time performance.

[0047]Next, in a reproduction performance, if the [search] (it opens) key is pressed, the file name of the music data memorized by the storage parts store 5 will be read by the input part 2, and it will be displayed on the display 4, [**] And if move cursor, the music data to reproduce is searched, it is chosen in order by the [**] key and the [search] key is again pressed by it, music data selected at the time will be read from the storage parts store 5 by the input part 2, and will be displayed on the display 4.

[0048]And a push on a [re-die] (reproduction) key will determine the reading speed of subsequent scale data according to the data of tempo which read music data and was again read first from the storage parts store 5 by the input part 2. And control which cursor moves to the scale data portion which read at a time 1 set of scale data of the music data reproduced from the storage parts store 5, and was read into the display 4 at the set-up reading speed is made to perform, and it is made for real time to understand the data read now.

[0049]And an octave of scale data and data of a pitch which were read are outputted to the temporary storage machine 8, and timing which reads the following scale data by data of sound length is measured.

[0050]And data of an octave memorized by the temporary storage machine 8 and a pitch is read by the sound-source generating part 6, it is the sound-source generating part 6, and is changed into an audio signal, and is outputted to the mixer 7.

[0051]On the other hand, it is outputted to the mixer 7 by sound of a partner who received in the call control part 2, and in the mixer 7. A partner's sound inputted from an audio signal inputted from the sound-source generating part 6 and the call control part 2 is compounded, it is outputted to the speaker 3 as a synthetic audio signal, and a synthetic audio signal inputted from the mixer 7 is outputted as a sound from the speaker 3.

[0052]In order to write music or carry out an automatic performance using a sound source, it is also connectable with a personal computer or sequence software. Then, the

display 4 of a portable telephone can also be made to serve a double purpose as composition or a monitor at the time of an automatic performance.

[0053]Although the above-mentioned explanation indicated that the sound-source generating part 6 generated a sound according to data of an octave and a pitch, As long as it gives a function controllable to a pitch and its length according to data which included sound length in the sound-source generating part 6, the input part 1 reads scale data from the storage parts store 5 simply, and you may make it output it to the temporary storage part 8.

[0054]According to the portable telephone of this invention, by the input part 1, input music data which consists of a beat, tempo, and scale data, and it memorizes to the storage parts store 5, At then, speed doubled with tempo which reads music data from the storage parts store 5, and is contained in music data by the input part 1. Change into an audio signal by the sound-source generating part 6, read scale data, output to the sound-source generating part 6 via the temporary storage part 8, output to the mixer 7, and with the mixer 7. Since a sound of a partner from an audio signal and the call control part 2 from the sound-source generating part 6 is made to compound and it outputs from the speaker 3 as a synthetic audio signal, An input and playback (performance) of music data can be performed with a portable telephone, by adding a musical function to a portable telephone, a use is expanded besides a telephone call and there is an effect which can raise utility value as what is always carried.

[0055]If data of a pitch is inputted by the input part 1 in performance mode according to this invention, Are changed into an audio signal by the sound-source generating part 6, and inputted interval data is outputted to the sound-source generating part 6 via the temporary storage part 8, is outputted to the mixer 7, and with the mixer 7. Since a sound of a partner from an audio signal and the call control part 2 from the sound-source generating part 6 is made to compound and it outputs from the speaker 3 as a synthetic audio signal, Work of composition etc. can be performed with a portable telephone, by adding a musical function, a use is expanded besides a telephone call and there is an effect which can raise utility value as what is always carried.

[0056]According to the portable telephone of this invention, change scale data to perform into an audio signal, and the sound-source generating part 6 outputs to the mixer 7, and the mixer 7, Since a sound of a partner who inputted from an audio signal inputted from the sound-source generating part 6 and the call control part 2 is made to compound, it outputs to the speaker 3 as a synthetic audio signal and it outputs as a sound from the speaker 3, an effect that music as BGM can be passed is during a telephone call.

[0057]Input music data which consists of a beat, tempo, and scale data by the input part 1 using a portable telephone of this invention, and it memorizes to the storage parts store 5, If music data memorized to the storage parts store 5 is played by the sound-source generating part 6 and played music is transmitted to a call partner from the call control part 2, a theme song etc. of a company which inputted, for example can also be made into tone on hold, and it is effective in added value being made.

[0058]

[Effect of the Invention]According to the invention according to claim 1, the scale data which comprises an octave, a pitch, and sound length expresses one note, Since it is considered as the portable telephone which generated music according to the music data which inputted and memorized the music data which connected scale data, and was memorized with directions of the performance and whose call voice and composition were enabled, By being able to perform a musical input and performance, and compounding and outputting the performance of a call voice and music, a use is expanded besides a

telephone call and there is an effect which can raise the utility value as what is always carried.

[0059]According to the invention according to claim 2, an input part inputs music data and memorizes to a storage parts store, A performance control section reads the memorized music data per scale data, and outputs the octave and pitch of scale data to a temporary storage part, By the sound length of scale data, measure the timing which reads the following scale data and a sound-source generating part, A musical audio signal is generated according to the octave and pitch of a temporary storage part, Since a mixer compounds the audio signal of the call voice from a call control part, and the audio signal of the music from a sound-source generating part and the speaker is considering it as the portable telephone which outputs the sound of the compounded audio signal, By being able to perform a musical input and performance, and compounding and outputting the performance of a call voice and music, a use is expanded besides a telephone call and there is an effect which can raise the utility value as what is always carried.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a configuration block figure of the portable telephone concerning this invention.

[Drawing 2] It is an appearance front view of the portable telephone of this invention.

[Drawing 3] It is an explanatory view showing the function of each key at the time of the performance and sound recording mode in the input part of this invention, and telephone (telephone call) mode.

[Drawing 4] It is a configuration block figure of the conventional portable telephone.

[Explanations of letters or numerals]

1 1' [-- A display and 5 / -- A storage parts store and 6 / -- A sound-source generating part and 7 / -- A mixer and 8 / -- Temporary storage part] -- An input part and 2 -- A call control part and 3 -- A speaker, 4, 4'

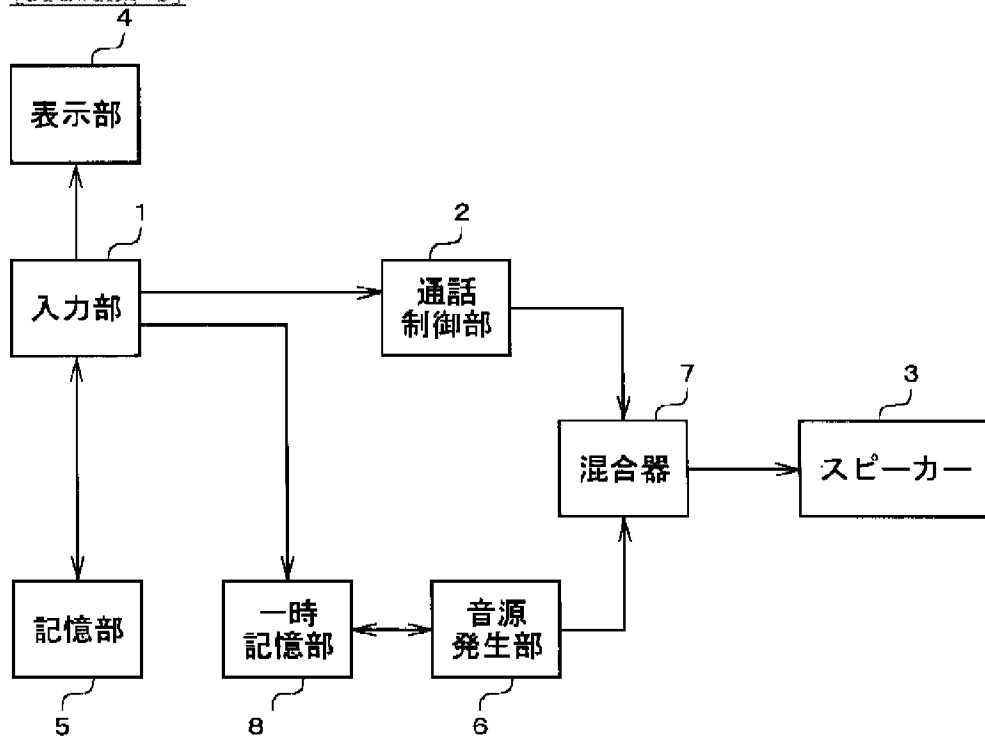
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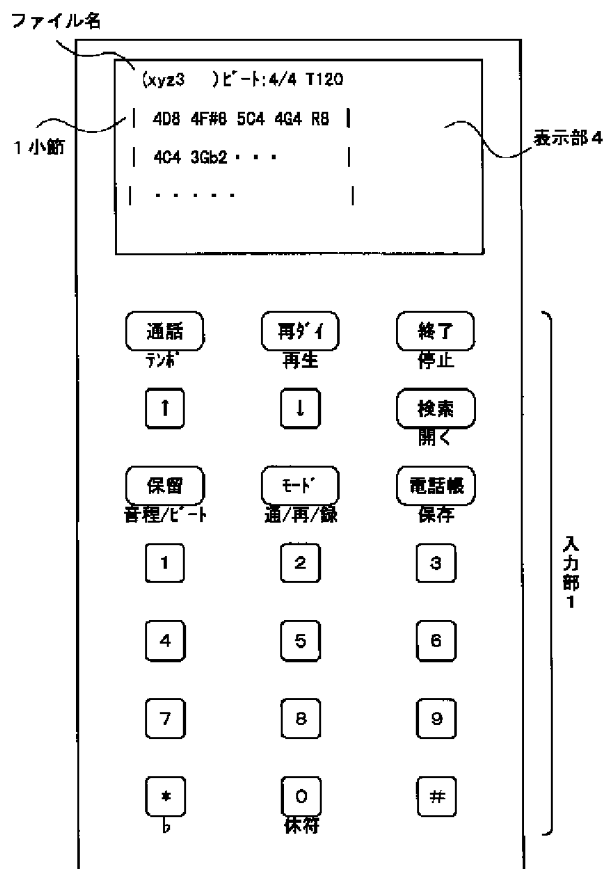
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DRAWINGS

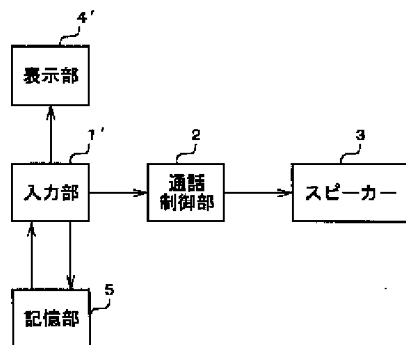
[Drawing 1][Drawing 2]



[Drawing 3]

キー	演奏・録音モードの場合	電話（通話）モードの場合
通 話	テンポの設定	発信または着信時の通話
再ダイ	自動演奏をする	再ダイヤルをする
終 了	自動演奏を停止する	電話を切る
↑	カーソルの移動	カーソルの移動
↓	カーソルの移動	カーソルの移動
電話帳	曲データの保存	記憶してある電話番号を見る
検 索	ファイルを開く	電話番号を検索する
保 留	音程/ビートの設定	通話を保留する
モード	電話/再生/録音の選択	電話/再生/録音の選択
1	ド（音名C）のデータ発生	電話番号の入力
2	レ（音名D）のデータ発生	電話番号の入力
3	ミ（音名E）のデータ発生	電話番号の入力
4	ファ（音名F）のデータ発生	電話番号の入力
5	ソ（音名G）のデータ発生	電話番号の入力
6	ラ（音名A）のデータ発生	電話番号の入力
7	シ（音名B）のデータ発生	電話番号の入力
8	ド・（音名C・）のデータ発生	電話番号の入力
9	レ・（音名D・）のデータ発生	電話番号の入力
0	休符（R）のデータ発生	電話番号の入力
#	直前データを半音上げる	電話番号の入力
*	直前データを半音下げる	電話番号の入力

[Drawing 4]



[Translation done.]